DOCKET NO: 220049US0

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF	:
SATOSHI HIRAHARA, ET AL.	: EXAMINER: VO, H.
SERIAL NO: 10/083,385	:
FILED: FEBRUARY 27, 2002	: GROUP ART UNIT: 1771
FOR: CONDUCTIVE CARBONACEOUS-FIBER SHEET AND SOLID POLYMER ELECTROLYTE FUEL CELL	:

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a Notice of Appeal.

The review is requested for the reason(s) stated on the attached sheet(s). No more than five (5) pages are provided.

I am the attorney or agent of record.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon

Kirsten Grüneberg

Kirsten A. Grüneberg, Ph.D.
Attorney of Record
Registration No. 47,297

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)

ATTACHMENT TO PRE-APPEAL BRIEF REQUEST FOR REVIEW

The Advisory Action dated December 12, 2005, indicated that the Amendment filed November 30, 2005, will be entered for purposes of appeal.

The present invention as set forth in **amended Claim 1** relates to a **conductive carbonaceous-fiber fabric** which has a thickness of from 0.05 to 1 mm, a weight per a unit area of from 60 to 250 g/m^2, a **bending resistance (L) as determined by the 45° Cantilever method of 6 cm or higher**, and an in-plane volume resistivity of 0.2 Ω cm or lower,

wherein the fabric comprises a binder or a product of carbonization of the binder in an amount of from 10 to 40% by weight and comprises **carbonaceous fibers bonded to one another with the binder or its carbonization product through point contact**,

wherein the binder or its carbonization product is present discontinuously as particles on the surface of the fibers, and

wherein said conductive carbonaceous-fiber fabric is obtained by weaving the yarns of carbonaceous fibers.

Claims 2-11, 13-15, 30, 32, 34, 36-40, 42-47 depend directly or indirectly on Claim 1.

Regarding **Claim 1 and the claims dependent thereon,** Applicants respectfully request pre-appeal review of the following issues:

1) Obviousness rejection. Claims 1-11, 13-15, 30, 32, 34, 36, 37, 42, 44, 44, 45 and 48 were rejected under 35 U.S.C. 103(a) over Miwa et al in view of Koschany et al. Claims 38 and 39 were rejected under 35 U.S.C. 103(a) over Miwa et al and Koschany et al and further in view of Schultz. Claim 40 was rejected under 35 U.S.C. 103(a) over Miwa et al and Koschany et al and further in view of Kato. Claims 46 and 47 rejected under 35 U.S.C. 103(a) over Miwa et al and Koschany et al and further in view of Tajiri et al.

2) Obviousness rejection. Claims 1-11, 13-15, 30, 32, 34, 36-38, and 42-48 were rejected under 35 U.S.C. 103(a) over Tajiri a et al in view of Koschany et al. Claim 39 was

rejected under 35 U.S.C. 103(a) over Tajiri et al and Koschany et al and further in view of Schultz. Claim 40 was rejected under 35 U.S.C. 103(a) over Tajiri et al and Koschany et al and further in view of Kato.

1) Miwa et al relates to a **carbon paper** which is obtained by molding chopped carbon fibers with a binder and carbonizing the molded products (col. 7, lines 20, 35, 48, 49). However, the present invention relates to a conductive **carbonaceous-fiber fabric** is obtained by weaving the yarns of carbonaceous fibers. In other words the fabric of the present invention is a woven fabric. A combination of Miwa et al with Koschany et al would materially change the **carbon paper** of Miwa et al. There is no motivation in Miwa et al to change from a carbon paper to a woven fabric as claimed.

As discussed in the specification, it was an object of the present invention to provide a conductive carbonaceous-fiber fabric that has the advantages of woven fabrics compared to carbon papers such as freedom from mechanical brittleness, high gas permeability and elasticity in the thickness direction. See paragraph bridging pages 4 and 5 and page 6, 1st full paragraph. In addition, it was an object of the present invention to **overcome the drawbacks of conventional carbonaceous woven fabrics**, such as difficulties of combining the woven fabrics with ribbed separators in which they could inhibit gas flow through grooves, as well as unstable electrical resistance of the woven fabric as a whole. See page 5, 1st paragraph. It was yet another object of the present invention to impart high stiffness and stable electrical conductivity on the fabric. These objects have been achieved according to the present invention with the claimed woven conductive **carbonaceous-fiber fabric** which combines a specific thickness, weight per area, bending resistance and in-plane volume resistivity. Such woven fabric is not disclosed or suggested by the combination of Miwa et al and Koschany et al.

It is stated at col. 2, starting at line 47 of Koschany et al, that when using carbon materials as support materials, **nonwovens** made of carbonized or graphitized fibers are particularly suitable due to their light weight high open porosity. In other words, if Koschany et al make a carbonaceous material then it's a **nonwoven** and **not a woven as claimed**. This is further evidenced for example by Example 1 at col. 8. Koschany et al do not recognize that woven conductive carbonaceous-fiber fabrics are superior to nonwovens. A person of ordinary skill in the art would not be motivated based on Koschany's disclosure that wovens are particularly suitable as for carbon support materials. In fact, a person of ordinary skill in the art would choose nonwovens for such materials based on Koschany's recommendation. Thus, Koschany et al provides no motivation to change Miwa et al from a carbon paper to a woven fabric as claimed. The secondary references Schultz, Tajiri et al and Kato do not cure the defects of the primary reference.

Moreover, none of Miwa et al, Koschany et al, Schultz, Tajiri et al and Kato disclose or suggest a woven conductive carbonaceous-fiber fabric as claimed having the claimed combination of thickness, weight per area, bending resistance and in-plane volume resistivity. In particular, there is no disclosure of a **bending resistance (L) as determined by the 45° Cantilever method of 6 cm or higher.** The bending resistance is an index of stiffness. See page 11 of the specification at line 12.

It is not obvious or inherent to make a woven fabric having the claimed bending resistance (stiffness). As disclosed in the specification of the present invention in the paragraph bringing pages 9 and 10:

> Ordinary carbonaceous-fiber woven fabrics are pliable, and the woven fabrics with thicknesses in the range of from 0.05 to 1 mm generally have a bending resistance (L) of 5 cm or lower. The invention has succeeded in increasing the bending resistance (L) by mutually fusing or bonding the fibers constituting a conductive carbonaceous-fiber sheet. The bending resistance (L) of the carbonaceous-fiber sheet of the invention is preferably 8 cm or higher.

Further, the specification discloses at the paragraph bridging pages 11 and 12:

> In the case where a carbonaceous-fiber sheet having too high stiffness is used as a gas diffusion layer material for fuel cells, the sheet is difficult to wind into a roll and, hence, tends to have reduced handleability and reduced transportability. Productivity also is apt to decrease.

Thus, even a combination of Miwa et al, Koschany et al, Schultz, Tajiri et al and Kato cannot result in the present invention.

2) Further, amended Claim 1 distinguishes the present invention from Tajiri et al because random webs are fabricated in this prior art reference by **hot pressing and melting** various fibers and phenolic resins to obtain pre-prepreg sheets which are then **molded** to provide a porous sheet. See Examples 1-15 at column 16 of Tajiri et al. Thus, there is no woven fabric in Tajiri et al. In addition, there is no motivation to change the random web of Tajiri et al into a woven fabric based on the disclosure of Koschany et al. Since Koschany et al disclose that nonwovens are preferable when using carbon support materials (col. 2, line 47, Example 1 at col. 8), a person of ordinary skill in the art would not change from a random web to a woven fabric. The secondary references Schultz and Kato do not cure the defects of the primary reference.

Further, none of Tajiri et al, Koschany et al, Schultz and Kato disclose or suggest a woven conductive carbonaceous-fiber fabric as claimed having the claimed combination of thickness, weight per area, bending resistance and in-plane volume resistivity. In particular, there is no disclosure of a **bending resistance (L) as determined by the 45° Cantilever method of 6 cm or higher.** It is not obvious or inherent to make a woven fabric having the claimed bending resistance (stiffness) because ordinary carbonaceous-fiber woven fabrics are pliable, and the woven fabrics with thicknesses in the range of from 0.05 to 1 mm generally have a bending resistance (L) of 5 cm or lower.

Therefore, the rejections over Miwa et al (US 4,851,304), Koschany et al (US 6,183,898), Schultz (US 3,960,601), Tajiri et al (US 5,648,027) and Kato (US 6,127,059) are

believed to be unsustainable as the present invention is neither anticipated nor obvious and withdrawal of this rejection is respectfully requested.

CONCLUSION

In view of the above remarks, the Applicants respectfully request that the rejections of record be withdrawn.